

Appln No. 09/939,196

Reply to Office action of 07/18/03

listings, of claims in the application:

Listing of Claims:

1. (currently amended) A fuel additive composition comprising:

a sustained release component and an additive component, the additive component is effective to provide at least one benefit to a fuel when released into the fuel,

the sustained release component is (1) substantially insoluble in the fuel, and (2) effective to reduce the rate of release of the additive component into the fuel relative to an identical composition without the sustained release component, the sustained release component comprises at least one polymeric material including polymer repeating units ~~derived~~ from an unsubstituted, aliphatic olefin component monomer having 2 to about 12 carbon atoms per molecule.

2. (canceled)

3. (canceled)

4. (original) The additive composition of claim 1 wherein the sustained release component is mixed with the additive component.

5. (original) The additive composition of claim 4 wherein the sustained release component is present as a matrix in which the additive component is located.

6. (previously amended) The additive composition of claim 1 wherein the sustained release component coats the additive component.

7. (original) The additive composition of claim 5 which further comprises an additional sustained release component coating the matrix and the additive component.

8. (previously amended) An additive composition comprising:
a matrix material and an additive component, the additive component being located in the matrix material and effective, when released into a fuel, to provide at least one benefit to the fuel,
the matrix material comprises at least one polymeric material and is (1) substantially insoluble in the fuel and (2) effective to reduce the rate of release of the additive component into the fuel relative to an identical composition without the matrix material.

9. (cancel)

10. (original) The additive composition of claim 8 wherein the matrix material is initially a solid in the composition.

11. (original) The additive composition of claim 8 wherein the matrix material is initially in a form selected from the group consisting of a gel and a paste.

12. (previously amended) The additive composition of claim 8 wherein the matrix material comprises more than one polymeric material.

13. (previously amended) The additive composition of claim 8 wherein the polymeric material includes polymer repeating units derived from an olefin component having 2 to about 12 carbon atoms per molecule.

14. (previously amended) The additive composition of claim 8 wherein the polymeric material comprises a polymer of ethylene.

15. (previously amended) The additive composition of claim 8 wherein the polymeric material comprises a copolymer of ethylene and vinyl acetate.

16. (previously amended) The additive composition of claim 8 wherein the polymeric material is at least partially oxidized or at least partially amidized.

17. (previously amended) The additive composition of claim 8 wherein the polymeric material is an oxidized polyethylene wax or an oxidized polypropylene wax.

18. (cancel)

19. (cancel)

20. (cancel)

21. (original) The additive composition of claim 8 wherein the composition has more than one layer, each layer comprises a different mixture of the additive component and the matrix material.

22. (original) The additive composition of claim 8 further comprising a coating material surrounding at least a portion of the additive component and the matrix material, the coating material being present in an amount effective to reduce the rate of release of the additive component into the fuel relative to an identical additive composition without the coating material.

23. (original) The additive composition of claim 22 wherein the coating material comprises a coating polymeric material.

24. (original) The additive composition of claim 23 wherein the coating polymeric material comprises polyethylene vinyl acetate.

25. (original) The additive composition of claim 22 wherein the matrix material has a different composition than the coating material.

26. (original) The additive composition of claim 22 wherein the matrix material has the same composition as the coating material.

27. (original) The additive composition of claim 22 wherein the composition further comprises a release enhancer component in an amount effective to increase the release rate of the additive component from the composition relative to an identical composition without the release enhancer component.

28. (original) The additive composition of claim 27 wherein the release enhancer component is selected from the group

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consisting of wicking materials, surfactants and mixtures thereof.

29. (original) The additive composition of claim 8 further comprising a reinforcement component in an amount effective to increase the structural strength of the composition relative to an identical composition without the reinforcement component.

30. (previously amended) An additive assembly comprising:
a housing including a fuel inlet and a fuel outlet; and
an additive composition disposed within the housing and including an additive component and a matrix material comprising at least one polymeric material, the additive component being located in the matrix material and effective, when released into a fuel, to provide at least one benefit to the fuel, the matrix material is (1) substantially insoluble in the fuel in contact with the additive composition and (2) effective to reduce the rate of release of the additive component into the fuel relative to an identical additive composition without the matrix material.

31. (cancel)

32. (original) The additive assembly of claim 30 wherein the matrix material is substantially hydrocarbon insoluble.

33. (previously amended) The additive assembly of claim 30 wherein the polymeric material includes polymer repeating units derived from an olefin component having 2 to about 12 carbon atoms per molecule.

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34. (previously amended) The additive assembly of claim 30 wherein the polymeric material includes polymer repeating units derived from ethylene.

35. (previously amended) The additive assembly of claim 30 wherein the polymeric material comprises a copolymer of ethylene and vinyl acetate.

36. (previously amended) The additive assembly of claim 30 wherein the polymeric material is at least partially oxidized or at least partially amidized.

37. (cancel)

38. (cancel)

39. (cancel)

40. (original) The additive assembly of claim 30 further comprising a coating material surrounding at least a portion of the additive component and the matrix material, the coating material being in an amount effective to reduce the rate of release of the additive component into the fuel relative to an identical additive composition without the coating material.

41. (original) The additive assembly of claim 40 wherein the coating material comprises a coating polymeric material.

42. (original) The additive assembly of claim 41 wherein the coating polymeric material is polyethylene vinyl acetate.

43. (original) The additive assembly of claim 30 wherein the additive composition is present in the housing as a plurality of particles.

44. (previously amended) A method of producing an additive composition for providing a benefit to a fuel comprising the steps of:

combining an additive component with a matrix material to form a mixture, the additive component being effective to provide at least one benefit to a fuel when released into the fuel, the matrix material being substantially insoluble in the fuel; and

forming one or more discrete units of the mixture, the matrix material comprises at least one polymeric material, the discrete unit or units of the mixture providing a reduced rate of release of the additive component into a fuel relative to an identical unit or units without the matrix material.

45. (original) The method of claim 44 wherein the matrix material is substantially hydrocarbon insoluble.

46. (original) The method of claim 44 wherein the matrix material has a melting point of at least about 82° C and the combining step at least partially occurs with the matrix material in the molten state.

47. (original) The method of claim 44 which further comprises providing a coating material on the one or more discrete units, the coating material being effective to reduce the rate of release of

the additive component into a fuel relative to an identical unit or units without the provided coating material.

48. (previously added) An additive composition comprising:
a matrix material and an additive component, the additive component being located in the matrix material and effective, when released into a fuel, to provide at least one benefit to the fuel, the matrix material comprises an aliphatic acid component and is (1) substantially insoluble in the fuel and (2) effective to reduce the rate of release of the additive component into the fuel relative to an identical composition without the matrix material.

49. (previously added) The additive composition of claim 48 wherein the aliphatic acid component includes aliphatic acid molecules having about 18 to about 36 carbon atoms.

50. (previously added) The additive composition of claim 48 wherein the aliphatic acid component includes aliphatic acid molecules having about 28 to about 36 carbon atoms.

51. (previously added) The additive composition of claim 18 wherein the aliphatic acid component includes a montanic acid.

52. (previously added) An additive assembly comprising:
a housing including a fuel inlet and a fuel outlet; and
an additive composition disposed within the housing and including an additive component and a matrix material comprising an aliphatic acid component, the additive component being located in the matrix material and effective, when released into a fuel, to provide at least one benefit to the fuel, the matrix material is

(1) substantially insoluble in the fuel in contact with the additive composition and (2) effective to reduce the rate of release of the additive component into the fuel relative to an identical additive composition without the matrix material.

53. (previously added) The additive composition of claim 52 wherein the aliphatic acid component includes aliphatic acid molecules having about 18 to about 36 carbon atoms.

54. (previously added) The additive composition of claim 52 wherein the aliphatic acid component includes aliphatic acid molecules having about 28 to about 36 carbon atoms.

55. (previously added) The additive assembly of claim 52 wherein the aliphatic acid component includes a montanic acid.

56. (new) The additive composition of claim 1 wherein the at least one polymeric material includes polymer repeating units from at least one of ethylene and propylene.

57. (new) The additive composition of claim 1 wherein the at least one polymeric material includes polymer repeating units from ethylene.

58. (new) The method of claim 44 wherein the polymeric material includes polymer repeating units derived from an olefin component having 2 to about 12 carbon atoms per molecule.